



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,691	03/08/2007	Henrik Sjoland	P18137-US2	9532
27045	7590	04/14/2011	EXAMINER	
ERICSSON INC. 6300 LEGACY DRIVE M/S EVR 1-C-11 PLANO, TX 75024			NGUYEN, SIMON	
			ART UNIT	PAPER NUMBER
			2618	
			NOTIFICATION DATE	DELIVERY MODE
			04/14/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

kara.coffman@ericsson.com
jennifer.hardin@ericsson.com
melissa.rhea@ericsson.com

Office Action Summary	Application No.	Applicant(s)
	10/596,691	SJOLAND ET AL.
	Examiner	Art Unit
	SIMON D. NGUYEN	2618

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 11 January 2011.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 30-58 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 30-58 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____. | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 1/11/11 have been fully considered but they are not persuasive. Molnar discloses the first mixing signal is out of phase with the second mixing signal (column 4 lines 16, 30-31) and Forgues discloses a quadrature mixer (title, abstract), in which a first mixing signal is out of phase with a second mixing signal (abstract, column 2 lines 8, 34, 57-60; column 3 lines 1 and 49; column 4 lines 40-47, 67).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 30 and 46 are rejected under 35 U.S.C. 102(e) as being anticipated by Molnar et al. (US 6,810,242 B2).

Regarding claim 30, Molnar discloses a quadrature mixer (106,108) for converting an I/Q RF signal to an I/Q IF signal, respectively (fig.1), comprising: a first mixer (106) coupled to an RF+ and an RF- (fig.2), and a second mixer (108) coupled in

parallel with the first mixer (fig.1) and coupled to the RF+ and RF- (it is noted that the arrangement of mixer 108 is not shown, but it is similar to the mixer 106 in fig.2), wherein the first mixer is operatively conductive for first and second states ((LO+ (+90)), LO -(-90)) of a first mixing signal (LO-I or in-phase signal) and arranged to mix a first signal (RF) with the first mixing signal (LO-I) to provide a second signal (IF- I signal), wherein the second mixer (not shown) is arranged similar to the first mixer as of the mixer 106 of fig.2; a set of switch devices (184) provided in a signal path between the mixers (186) and the first and second terminals (170), wherein the switch devices coupled to the first mixer are arranged to conduct for the first and second states of the second mixing signal and switch devices coupled of the second mixer are arranged to conduct for the first and second states of the first mixing signal (fig.2, column 4 line 45 to column 5 line 8). It should be noted that fig.2 showing the first mixer 106 (fig.1) for mixing RF-I, the second mixer 108 is arranged similar to the mixer 106 but not shown). Molnar further discloses the first mixing signal is out of phase with the second mixing signal (column 4 lines 16, 30-31).

Regarding claim 46, this claim is rejected for the same reason as set forth in claim 30, as a method.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 30-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Manku et al. (US 6,639,447 B2) in view of Forgues (US 5,999,804).

Regarding claim 30, Manku discloses a quadrature mixer (fig.5a, column 1 line 60) for converting an I/Q RF signal to an I/Q IF signal, respectively (fig. 5a), comprising: a first mixer (passive mixer 530) coupled to an RF+ and an RF- (RF amplifier 500), and a second mixer (passive mixer 520) coupled in parallel with the first mixer and coupled to the RF+ and RF- (RF amplifier 500), wherein the first mixer is operatively conductive for first and second states ((LO I+, LO I-) of a first mixing signal (I or in-phase signal) and arranged to mix a first signal (RF) with the first mixing signal (LO-I) to provide a second signal (IF OUT I+,- signals), wherein the second mixer (520) is arranged similar to the first mixer (fig.5a); a set of switch devices (Active mixers 540, 550) provided in a signal path between the mixers (passive mixers 520, 530) and the first and second terminals (500), wherein the switch devices coupled to the first mixer are arranged to conduct for the first and second states of the second mixing signal and switch devices coupled of the second mixer are arranged to conduct for the first and second states of the first mixing signal (fig.5a-5f, column 5 line 49 to column 7 line 12). However, Manku does not specifically disclose the first mixing signal is out of phase to the second mixing signal.

Forgues, in the same field of the invention, discloses a quadrature mixer (title, abstract), in which a first mixing signal is out of phase with a second mixing signal (abstract, column 2 lines 8, 34, 57-60; column 3 lines 1 and 49; column 4 lines 40-47,

67). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have Manku, modified By Forgues to get high gain, low noise, and as the result to improve output level in linearity.

Regarding claim 46, this claim is rejected for the same reason as set forth in claim 30, as a method.

Regarding claims 37-38, 53-54, Manku further discloses the set of switch devices (540, 550) formed by transistors (figs. 5c, 5d) and comprises a voltage controlled switch (Vss)(figs. 5c, d).

Regarding claim 39-40, 55-56, Manku further discloses the FET transistors with CMOS (column 3 line 29, column 4 line 13).

Regarding claims 41-42, 57-58, Manku further discloses the mixer used in a receiver (fig.5a) of a wireless communication device (column 1 line 9-10). Further, Manku suggested that the mixer could also be used in a transmitter (column 1 line 30-47). It should be noted that if the quadrature mixer as taught by Manku in figs. 5a-f applied in a transmitter, positions of the RF signal in figs. 5a-f will become the IF signal and the IF signal will become the RF signal which is known to those skilled in the art.

Regarding claim 43-45, Manku further discloses the mixer used in a communication device such as a wireless phone (column 1 line9-10).

Regarding claims 31 and 47, Manku discloses the first and second mixing signals are LO I and LO Q signals having a common frequency (fig.5a). However, Manku fails to teach a phase shifting of pi/2.

Forgues discloses a quadrature mixer having first and second phases with a phase shifting of $\pi/2$ (0 to 90 degrees) in relation to each other (fig.3, summary). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have Manku, modified by Forgues to reduce noise which will improve the performance of a mixing circuit.

Regarding claims 32 and 48, Manku discloses the mixers 520, 530, each having first terminal (RF), second terminal (IF), third terminal LO, (fig.5a), wherein Forgues discloses a different phase shifting for the mixers (fig.3). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have Manku, modified by Forgues to reduce noise which will improve the performance of a mixing circuit.

Regarding claim 33 and 49, Manku further discloses wherein each of mixers' first terminals of a first and a third mixing means of the set of mixing means are coupled to the first terminal and second terminals of the first and third mixing means are coupled to first terminals of a second and a fourth mixing means of the set of mixing means, second terminals of the second and fourth mixing means are coupled to the second terminal, and wherein IF terminals are provided at the second terminals of the first and third mixing means (figs. 5a-f).

Regarding claims 34 and 50, Manku further discloses the quadrature mixer formed by transistors and coupled as claimed (figs. 5a-f).

Regarding claim 35-36 and 51-52, Manku further discloses the switch device (540, 550) coupled to passive mixers 520, 530 as claimed (figs. 5a-5f).

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Simon Nguyen whose telephone number is (571) 272-7894. The examiner can normally be reached on Monday-Friday from 7:00 AM to 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duc M. Nguyen can be reached on (571) 272-7503. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

April 8, 2011
/SIMON D NGUYEN/
Primary Examiner, Art Unit 2618